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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/683,615	10/10/2003	Richard J. Tansey	038190/259107	1825
826	7590	01/24/2006	EXAMINER	
ALSTON & BIRD LLP BANK OF AMERICA PLAZA 101 SOUTH TRYON STREET, SUITE 4000 CHARLOTTE, NC 28280-4000			DETSCHER, MARISSA	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 01/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/683,615

Applicant(s)

TANSEY, RICHARD J.

Examiner

Marissa J. Detschel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5 and 12-14 is/are rejected.
- 7) ☒ Claim(s) 1,3,6-12 and 15-18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/10/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement filed on October 10, 2003, has been fully considered by the examiner.

### ***Claim Objections***

Claims 1, 6, 12, and 15 objected to because of the following informalities: These claims recite the limitation "the received beam" in line 10 of claim 1, line 15 of claim 6, line 9 of claim 12, and lines 13-14 of claim 15. There is insufficient antecedent basis for this limitation in these claims. Examiner suggests changing the limitation to "the target beam."

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 5 rejected under 35 U.S.C. 102(b) as being anticipated by Heflinger et al. (USPN 6,243,168).

As to claims 1 and 12, Heflinger discloses a heterodyne interferometer comprising

an acoustic-optical modulator (AOM) (16) capable of receiving an optical source signal (14) and an electrical radio frequency (RF) signal (18, 20),

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superimposing the RF signal on the source signal, and thereafter outputting a zero order, un-modulated optical beam (22) and a higher order, modulated optical beam (24), wherein one of the zero order and higher order beams comprises a target beam and the other beam comprises a local oscillator beam (column 2, line 62 to column 3, line 46);

a telescope (34) capable of receiving the target beam (22), and thereafter directed the target beam through a beam propagation medium to a target such that at least a portion of the received beam can reflect off the target (32) (column 3, lines 47-51);

a beam splitter (40) capable of receiving the local oscillator beam (24) and the reflected beam (22) from the target (32), wherein the beam splitter is capable of coherently combining the local oscillator beam and the reflected beam to produce a fringe pattern (column 3, lines 55-60); and

a detector (46, 48) capable of detecting the fringe pattern to thereby generate an electrical beat signal to permit the beat signal to be subsequently demodulated based upon the RF signal to thereby determine an electrical signal proportional to a phase difference between the reflected beam and the local oscillator beam, wherein the phase difference can represent an optical path difference between the beam splitter and the target (column 4, line 26-61).

Regarding claim 2, the telescope of Heflinger's device comprises a transmitting telescope (34), and wherein the heterodyne interferometer further comprises a receiving telescope (34) capable of receiving the reflected beam (22) and thereafter directing the reflected beam to the detector (46, 48). As can

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be seen in figure 1, the telescope (34) transmits a target beam 22 to target 32 and then receives the reflected beam 22 off the target 32 and directs the beam to the detector (46, 48).

In regards to claims 4 and 13, Heflinger's heterodyne interferometer comprises a signal source (12) capable of providing a source signal (14), wherein the source signal (14) has a coherence length at least as long as a round trip distance between the telescope (34) and the target (32) (column 2, line 62 to column 3, line 1). Heflinger discloses that any coherent source can be used in the heterodyne interferometer. A source with a coherence length at least as long as a round trip distance between the telescope and the target would be inherent to use in order to have a majority of the source signal reflect off the target and be sent through the heterodyne interferometer, providing a more accurate measurement.

Regarding claims 5 and 14, the beam splitter (40) of Heflinger is capable of coherently combining the local oscillator beam (24) and the reflected beam (22) such that the detector is capable of having a minimum detectable power above a power of the reflected beam (column 3, lines 55-60 and column 4, lines 26-35). The photodetector used would have to meet this limitation in order for the RF frequency beat signal to be formed.

***Allowable Subject Matter***

Claims 6-11 and 15-18 are objected to based on the minor informalities set forth in this Office Action, but would be allowable if rewritten to overcome these minor informalities.

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Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As to claim 3, the prior art of record, taken alone or in combination, fails to disclose or render obvious the use of a half-wave plate, polarizing beam splitter, and a quarter-wave plate to circularly polarize a vertically-polarized target beam, reflect the beam off the target allowing the beam to be circularly polarized in an opposite direction, use the quarter-wave plate to receive the beam and rotate the plane of polarization ninety degrees, and send the beam back through the polarizing beam splitter in order to reflect the beam to a detector as a non-polarized beam, along with the rest of the limitations of claims 3 and 11.

As to claims 6-11 and 15-18, the prior art of record, taken alone or in combination, fails to disclose or render obvious the use of an adaptive optics assembly in the form of a deformable mirror with a heterodyne interferometer including a transmitter assembly capable of superimposing an RF signal on a source signal, along with the rest of the limitations of claims 6 and 15.

### ***Conclusion***

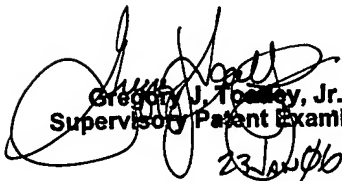
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marissa J. Detschel whose telephone number is 571-272-2716. The examiner can normally be reached on M-F 8:30am-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Marissa J Detschel  
January 13, 2006  
MJD

  
Gregory J. Toatley, Jr.  
Supervisory Patent Examiner  
23 Jan 06